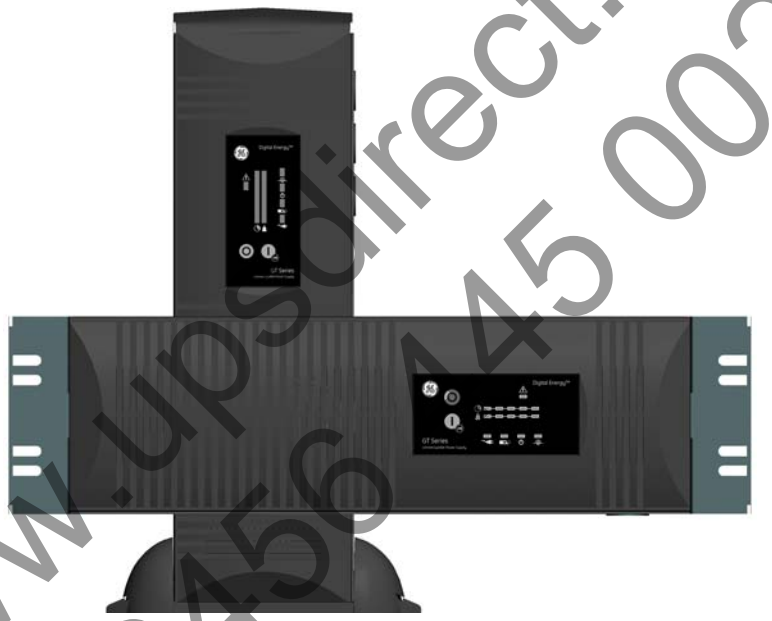
GE Digital Energy
Power Quality

User manual

Digital Energy™ Uninterruptible Power Supply

GT Series UPS
6 - 10 kVA



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User manual

GT Series - Uninterruptible Power Supply 6 - 10 kVA

We thank you for selecting a General Electric Digital Energy™ GT Series Uninterruptible Power Supply.

Please read these instructions carefully before installation and start-up of the GT Series UPS. Keep this manual in a safe place for future reference.

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Contents

1 Important safety instructions 4
1.1 Save these instructions 4
1.2 Safety rules 4
2 Introduction 5
2.1 Introduction 5
2.2 Intended use 5
2.3 Transport / storage 5
2.4 Warranty 5
3 Installation 6
3.1 Package contents 6
3.2 Installation rules 6
3.3 Installation procedure 7
3.3.1 Rackmount installation – preparations 7
3.3.2 Vertical installation – preparations 8
3.3.3 Connecting the battery 9
3.3.4 Connecting interface devices 9
3.3.5 Rear panel 10
3.3.6 Standard installation procedure 11
3.4 Parallel Operation 12
3.4.1 Installation of a parallel system 12
3.4.2 Installing the parallel connection 13
4 Operation 14
4.1 Operating panel 14
4.2 Start-up 15
4.2.1 Start-up of a Single Unit 15
4.2.2 Start up of a parallel system 15
4.3 Use: normal operation 15
4.3.1 Normal operation conditions: 15
4.3.2 Switching off 15
4.4 Use: status and alarm indications 16
4.4.1 On bypass 17
4.4.2 On battery 17
4.4.3 Battery low (end of runtime) 17
4.4.4 Bypass out of limits 17
4.4.5 Overload 17
4.4.6 Replace battery 18
4.4.7 Alarm priority 18
4.4.8 Fault mode 18
4.4.9 Stand-by 18
4.4.10 Emergency Shutdown (ESD) 19
4.4.11 Remote Power Off (RPO) 19
4.4.12 No load shutdown 19
4.4.13 Auto Restart 19
4.5 Battery management 20
5 Communication 21
5.1 DB9 Communication port 21
5.2 SNMP interface card (option) 21
6 Option: extended runtime 21
7 Maintenance 22
7.1 Safety 22
7.2 General 22
7.3 Recycling the UPS at the end of service life 22
7.4 Batteries 22
7.4.1 Battery replacement 23
8 Troubleshooting 24
9 Specifications 25

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1 IMPORTANT SAFETY INSTRUCTIONS

1.1 SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of the UPS. It also gives all necessary information about the correct use of the UPS. Before attempting to install and start up the UPS, carefully read this manual. Keep this manual next to the unit for future references.

Full understanding of and compliance with the safety instructions and warnings contained in this manual are the

ONLY CONDITIONS

to avoid any dangerous situation during installation, operation and maintenance work, and to preserve the maximum reliability of the UPS system.

GE refuses any responsibility in case of non-observance, unauthorized alterations or improper use of the delivered UPS.

The instructions in this manual are for CE UPS models GT Series 6kVA and GT Series 10kVA. Check your model number by looking at the top cover of your UPS. Any difference in instructions is clearly indicated in the text, for instance '(GT Series 10kVA)'.

While every care has been taken to ensure the completeness and accuracy of this manual, GE accepts no responsibility or liability for any loss or damage resulting from the use of the information contained in this document.

This document shall not be copied nor reproduced without the permission of GE.

Due to technical improvements, some of the information contained in this manual may be changed without notice.

1.2 SAFETY RULES

CAUTION! RISK OF ELECTRIC SHOCK.

The UPS contains batteries. The appliance outlets may be electrically live, even when the UPS is disconnected from the mains.

The UPS contains potentially hazardous voltages. Do not open the unit, there are no user serviceable parts inside.

All maintenance and service work, *except replacement of the batteries and plug-in cards*, should be performed by qualified service personnel.

CAUTION

There may be damage to the equipment if procedures and practices are not strictly observed and followed.

NOTE

Do not attempt to service the UPS unless you have had proper training. Refer all maintenance and servicing to properly qualified, skilled and competent service personnel.

WARNING

This is a Class A-UPS product. In a domestic environment this product may cause radio interference, in which case the user may be required to take additional measures.

Qualified, skilled personnel are persons who (because of their training, experience, and position as well as their knowledge of appropriate standards, regulations, health and safety requirements and working conditions) are authorised to be responsible for the safety of the equipment, at all times whilst carrying out their normal duties and are therefore aware of, and can report, possible hazards (observe IEC 60364 and national wiring regulations and accident prevention rules).

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2 INTRODUCTION

2.1 INTRODUCTION

The **GE (General Electric) Digital Energy GT Series UPS**, a truly on-line uninterruptible power supply, protects your equipment from all forms of power interference, including complete power failures.

2.2 INTENDED USE

- Uninterruptible Power Supplies (UPS) are designed to protect sensitive electronic equipment such as computers and telecommunications equipment from all forms of power interference, including complete power failure.

	CAUTION! DO NOT plug household appliances such as electric heaters, toasters or vacuum cleaners into the UPS. The UPS output is intended to be used only for electronic loads such as computers and telecommunications equipment.

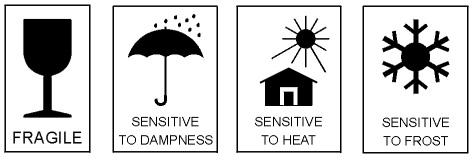
- The technical data as well as information concerning connecting requirements can be found on the rating label and in this document and shall be strictly observed.

2.3 TRANSPORT / STORAGE

	NOTE Check for sufficient floor and elevation loading capacity. Move the UPS in its original package to the final destination room. Do not stack other package on top.

	BE CAREFUL! Pay attention to the HEAVY WEIGHT of the UPS when downloading the UPS from the pallet! Never try to lift the unit by yourself!

- No liability can be accepted for any transport damage when the equipment is shipped in non-original packaging.
- Store the UPS in a dry location with the batteries in a fully charged state. Storage temperature must be within -20 +45 °C. If the unit is stored for a period exceeding 3 months, optimal battery lifetime is obtained if the storage temperature does not exceed 25°C.
- If the unit is stored for an extended period of time, the batteries must be recharged periodically. Connect the unit to a wall outlet and recharge the batteries for 24 hours:
  - if the storage temperature is within -20 and +30°C: every 3 months,
  - if the storage temperature is within -20 and +45°C: every 1 month.

	CAUTION In case of storage, pay attention to:	

2.4 WARRANTY

GE Consumer & Industrial SA, operating through its authorized agents, warrants that the standard products will be free of defects in materials and workmanship for a period of 24 months after the date of invoice, or such other period as may be specified.

	NOTE This warranty does not cover failures of the product which result from incorrect installation, misuse, alterations by persons other than authorized agents, or abnormal operating conditions.

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3 INSTALLATION

3.1 PACKAGE CONTENTS

The UPS shipping box contains:

- 9 plastic parts
- 4 metal parts (rackmount installation see 3.3.1)
- 1 screws set – 1 display sticker (vertical orientation)
- 1 RS232 cable
- 1 CD-ROM (Software Tool)
- 1 parallel cable
- this manual

The Battery cabinet shipping box contains:

- 4 plastic parts
- 4 metal parts (rackmount installation see 3.3.1)
- 1 screws set
- 1 battery cable
- 1 display sticker (vertical orientation)

Inspect the UPS for damage after unpacking. If any damage is present please immediately notify the carrier and place of purchase.

WARNING! In case of recognizable damage:
DO NOT connect any voltage to the unit
DO NOT put the unit into operation

3.2 INSTALLATION RULES

IMPORTANT
Before making any connection and switching on the GT Series UPS, please check the following conditions:

- Your mains supply is 220 - 240 Volts and 50 Hz (if the mains frequency is 60Hz, the output frequency of the UPS can be changed, see note in section 4.4.4), and
- The total power demand of the connected equipment does not exceed the rated output power of the GT Series UPS (the rear panel of the UPS shows the model, chapter 9 the ratings).
- Avoid locations that are excessively humid, near water, near heat sources or in direct sunlight.
- The ambient temperature should not exceed 40°C. Optimal battery lifetime is obtained if the ambient temperature does not exceed 30°C.
- It is important that ventilation air can move freely around and through the unit. Do not block the air vents.
- The branch circuit supply has to be protected as follows:

UPS model	branch protection
GT Series 6kVA	25A slow
GT Series 10kVA	50A slow

CAUTION
To reduce risk of fire, connect the UPS only to a circuit provided with the fuse values according to the above.

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3.3 INSTALLATION PROCEDURE

The UPS can be used in a stand alone tower format using the two supporting stands (section 3.3.2), or can be mounted in a 19 inch rack using the two mounting brackets (section 3.3.1). All required items are included in the delivery, except rails – available as railkit option.

	NOTE The UPS output sockets are live as soon as the UPS is connected to the mains, even if the UPS has not been switched on via the front panel.

3.3.1 Rackmount installation – preparations

1. Place the UPS and matching battery cabinet horizontally on a flat surface.

2. Install the two mounting brackets that came with the unit using the provided screws (2, fig. 3.3.1).

3. Mount the front panel by pushing the plastic part into the appropriate holes (3, fig. 3.3.1).

4. Install the UPS into a 19' rack. The UPS cabinet must be supported by mounting rails, **do not mount it by using the mounting brackets only.** Fix the mounting brackets on the 19 inch enclosure with screws.

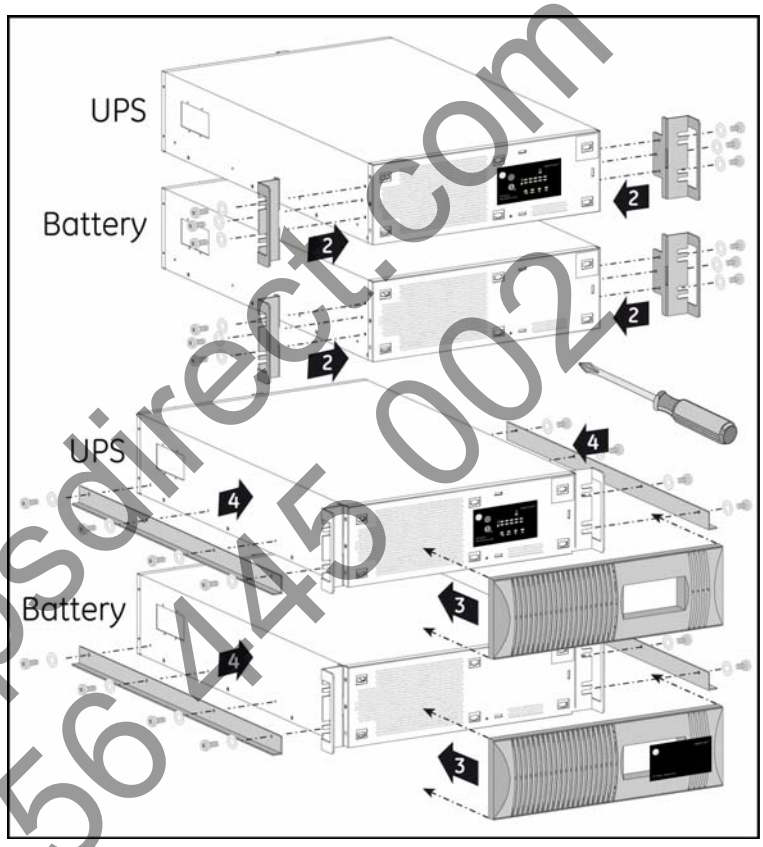
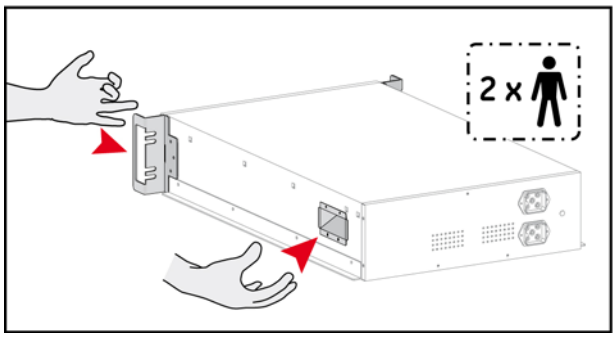
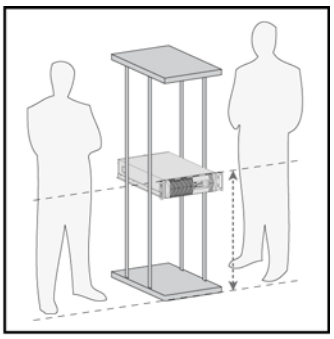


fig. 3.3.1

	NOTE Please consider the weight of the UPS (see section 9) prior to installation to ensure the rack or floor are capable of supporting the weight. For rack installation we recommend that the UPS is placed in the lower section of the rack. Fit the unit and the battery into the rack cabinet with the help of a second person.





The GT Series UPS is now ready for further connections. Please proceed with section 3.3.3.

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3.3.2 Vertical installation – preparations

1. Place the UPS and matching battery cabinet horizontally on a flat surface.

2. Assemble the plastic support feet and mount them to UPS and battery cabinet bottom (2, fig. 3.3.2.a).

3. Place the cabinets upright and mount the top cover (3, fig. 3.3.2.a).

4. Attach the display sticker to the UPS cabinet (4, fig. 3.3.2.b).

5. Mount the front panel on the UPS and on battery cabinet (5, fig. 3.3.2.b/c).

6. Attach the display sticker to the battery cabinet (4, fig. 3.3.2.c).

The GT Series UPS is now ready for further connection: proceed with section 3.3.3.

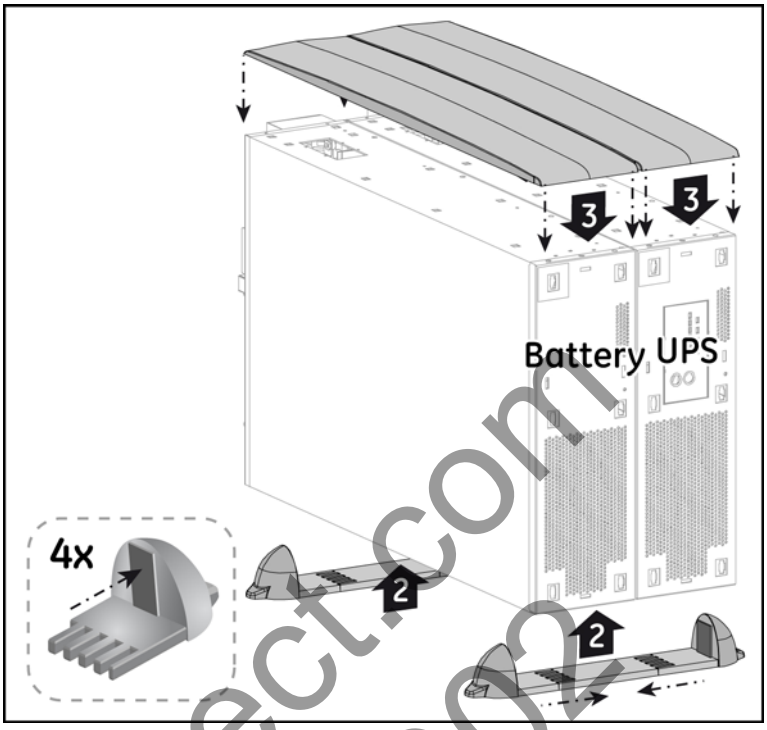

fig. 3.3.2.a

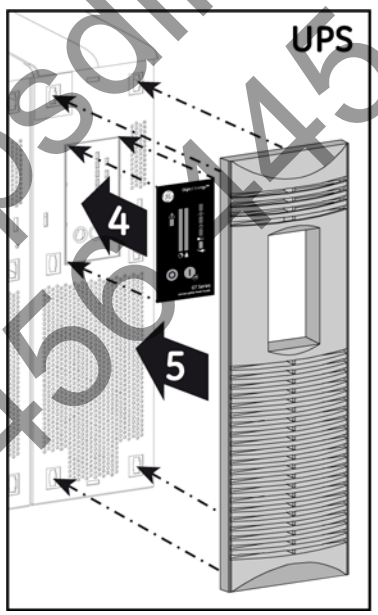

fig. 3.3.2.b

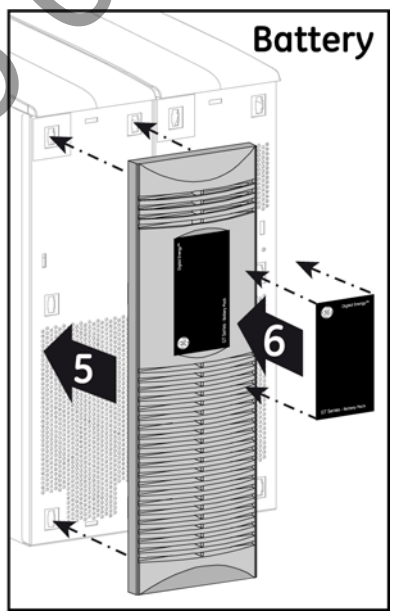

fig. 3.3.2.c

NOTE

There's no need to remove the front cover before applying the display sticker of the battery cabinet.

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3.3.3 Connecting the battery

The battery pack connects to the UPS in the same way whether the UPS is being used in tower or rackmount format. When used in tower format, the UPS and the battery pack can be mounted together in one set of mounting supports (fig. 3.3.2.a)

Connect the battery cable provided between the UPS and the battery pack - plug it into the UPS battery socket and the nearest battery connection socket on the battery pack (fig. 3.3.3.a).

NOTE

If additional battery packs are used, they connect via the previous battery pack. Thus, the cable provided is attached via the nearest socket connection on the existing battery cabinet (fig. 3.3.3.b).

NOTE

When the UPS is connected to the mains, and the battery pack is connected to the UPS, the batteries start charging. For best results, allow the UPS to recharge the batteries during a period of approx. 8 hours. It is acceptable to use the UPS without first charging the battery, but the runtime may be reduced.

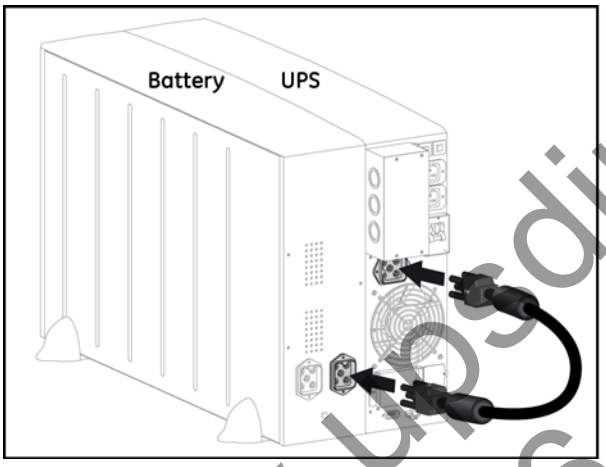

fig. 3.3.3.a

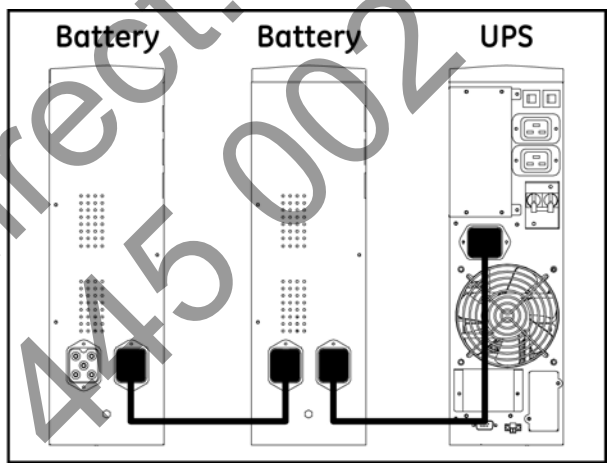

fig. 3.3.3.b

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3.3.4 Connecting interface devices

The UPS is equipped with two interface ports: a DB9 communication port and an SNMP card slot.
The DB9 port can be connected to a computer system by connecting the serial cable included in the UPS shipping box (fig.3.3.4.a). See section 5.1 for more information.
The SNMP slot allows easy installation of plug-in SNMP Card (fig.3.3.4.b). See section 5.2 for more information.

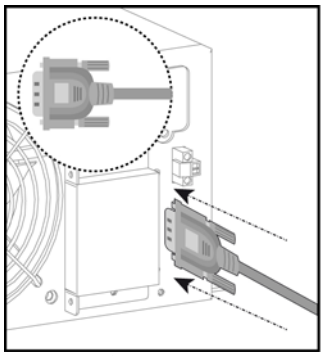

fig. 3.3.4.a

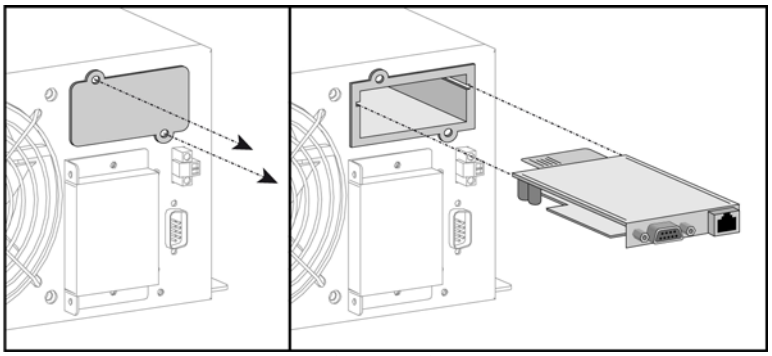

fig. 3.3.4.b

3.3.5 Rear panel

1. Paralleling terminals (see section 3.4.2)
2. ESD (emergency shutdown) (see 4.4.10)
3. Input/output terminals (see section 3.3.6)
4. External battery connector
5. Parallel port
6. DB9 communication port
7. RPO contacts (see 4.4.11)
8. SNMP card slot
9. Fan
10. Input circuit breaker:

    2 pole, 30A/250Vac – 6kVA

    2 pole, 63A/250Vac – 10kVA
11. Output sockets, IEC320 16A
12. Output circuit breakers

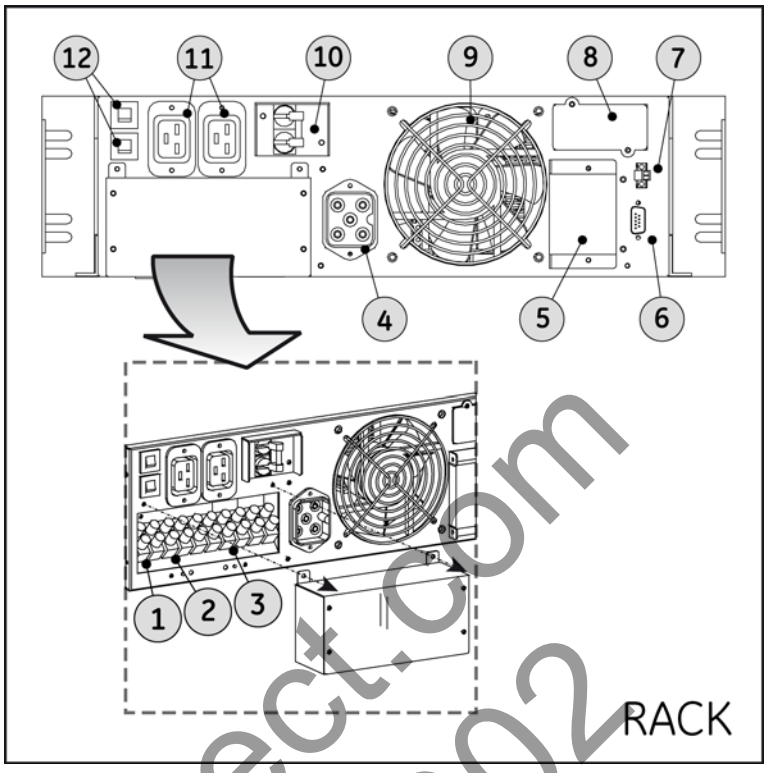

fig. 3.3.5.a

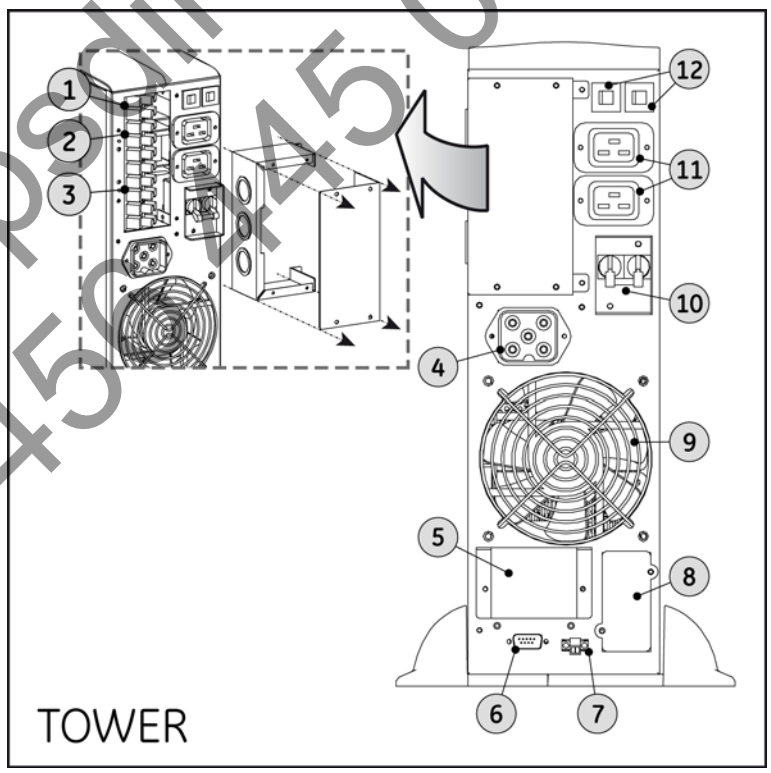

fig. 3.3.5.b

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3.3.6 Standard installation procedure

NOTE

Ensure that the UPS is isolated prior to installation; no live input source may be connected to the UPS during the installation procedure. Open all the input/output switches/breakers on the power distribution and ensure no one is able to close them during this installation step.

1. Remove the terminal cover (fig. 3.3.6.a).

2. Punch out the appropriate holes in the terminal cover. Secure the input/output cables using glands, according to fig. 3.3.6.b.

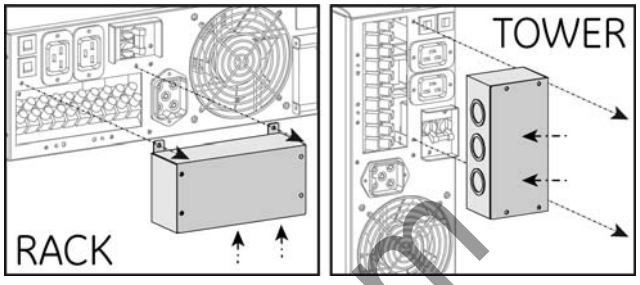

fig. 3.3.6.a

3. Input. Connect the mains supply wires to the terminals "L" (Line) and "N" (Neutral) and the ground wire to terminal "⏚". **Ground connection is essential!** (fig. 3.3.6.c).

4. Output. Connect the load wires to the terminals "L" (Line) and "N" (Neutral) and the ground wire to terminal "⏚". **Ground connection is essential!** (fig. 3.3.6.c).

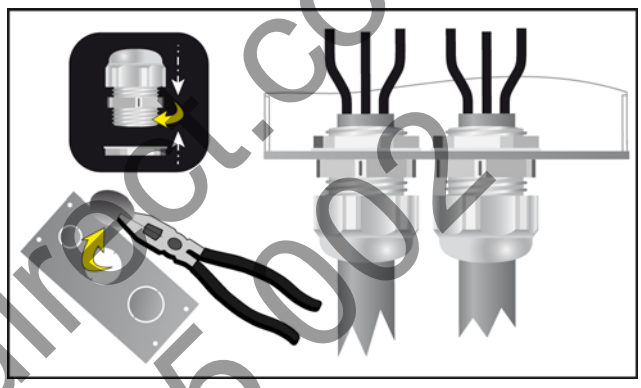

fig. 3.3.6.b

5. Re-install the terminal cover (fig. 3.3.6.d).

6. Ensure the battery cable is connected between the battery cabinet and the power unit. (see 3.3.3).

7. Connect the utility power to the UPS.

8. For a quick start proceed with section 4.2.1.

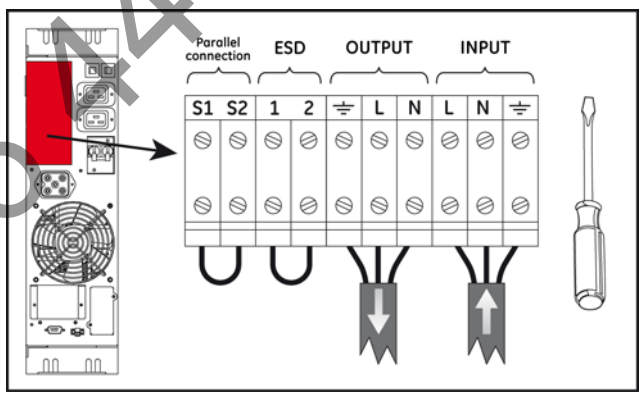

fig. 3.3.6.c

If parallel-operating units will be installed, please proceed with section 3.4. Otherwise, proceed with section 4.

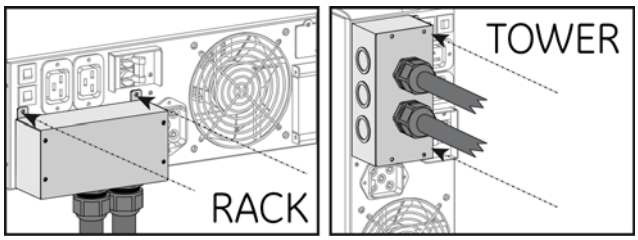

fig. 3.3.6.d

NOTE

The UPS output sockets are live soon as the UPS is connected to the mains, even if the UPS has not been switched on via the front panel.

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3.4 PARALLEL OPERATION

The paralleling cable delivered with each UPS allows you to connect up to 3 UPS together in a parallel system.

	NOTE The units connected in parallel must be the same power rating. (i.e. 6 kVA-6kVA not 6kVA-10kVA).

3.4.1 Installation of a parallel system

1. All inputs of the UPS must be supplied from the same phase. This is to enable bypass operation of the parallel system. All inputs must be individually protected by fuses in the installation. The values of these fuses should correspond to the values mentioned in section 3.2.

2. All outputs must be connected together, supplying the load. It is advised to install switches (S 1,2,3 fig 3.4) in the output wiring, in order to be able to isolate a unit from the remaining system for service and maintenance purposes.

3. The diameter of input and output cables must be according to the table in the installation specifications (see chapter 9, table 1). Cables with different diameters can cause tripping fuses in the UPS and/or the installation.

4. The length of all input cables from the input junction (Li, fig. 3.4) to the UPS inputs should be equal. The same applies to the cables from the outputs to the output junction (Lo, fig. 3.4). The minimum length of the input as well as the output cables is 3 meters.

5. The overall system load may not exceed 100% load of a single UPS in the configuration without the addition of an external maintenance bypass.

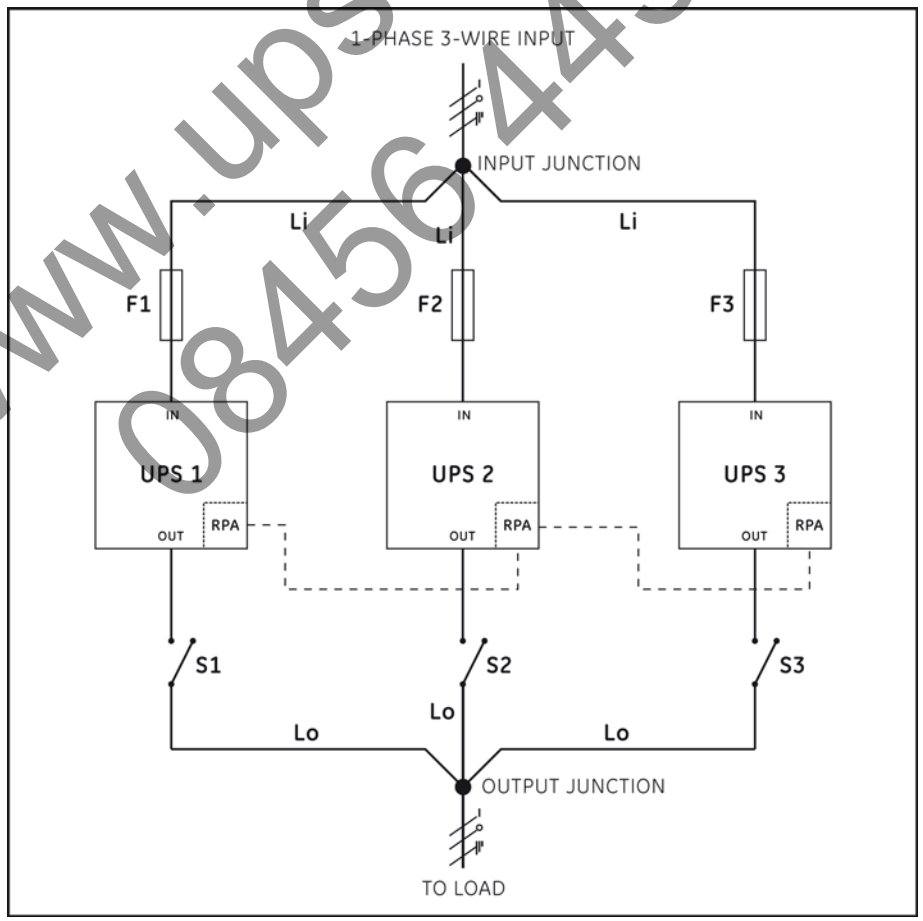

fig. 3.4

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3.4.2 Installing the parallel connection

NOTE

Ensure that the UPS is isolated prior to installation; no live input source may be connected to the UPS during the installation procedure. Open all the input/output switches/breakers on the power distribution and ensure no one is able to close them during this installation step.

1. Remove terminal cover (see 3.3.6).

2. Remove jumper S1 - S2 from parallel connection terminals on the power unit terminal block (fig. 3.4.2.a).

3. The parallel cable connection slot is at the rear of the power unit. Remove terminal cover (fig. 3.4.2.b).

4. Connect the cable provided with the UPS (fig. 3.4.2.c).

5. One cable connects two UPS in parallel. To connect a third UPS into the parallel system, repeat the process as above (fig. 3.4.2.d).

6. Remount the cover with the additional metal part included in the unit shipping box (fig. 3.4.2.e/f).

7. For a quick start of the system proceed with section 4.2.2.

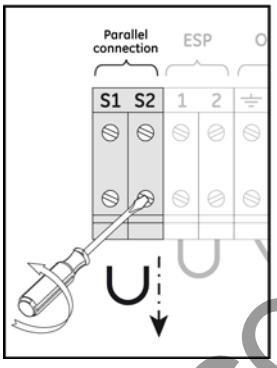

fig. 3.4.2.a

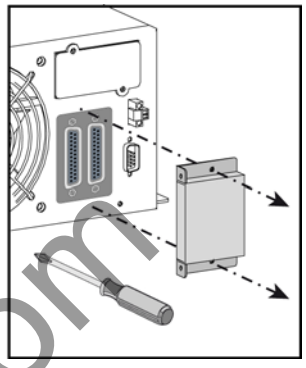

fig. 3.4.2.b

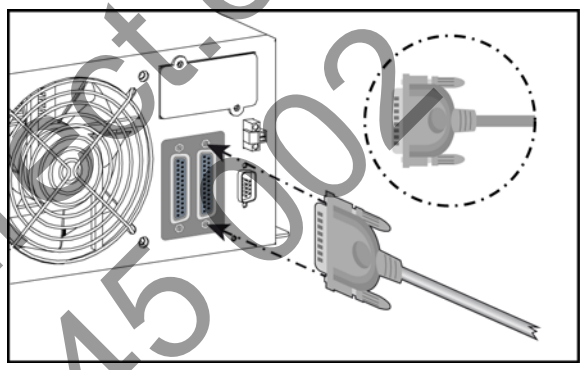

fig. 3.4.2.c

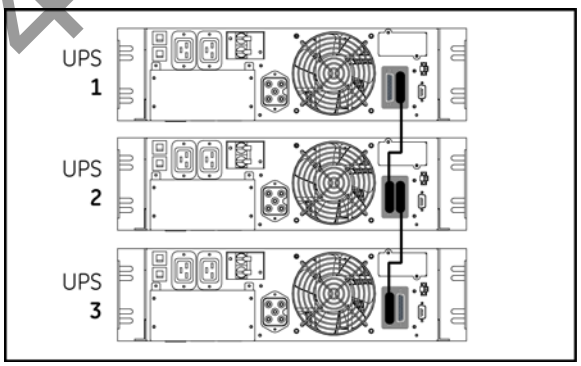

fig. 3.4.2.d

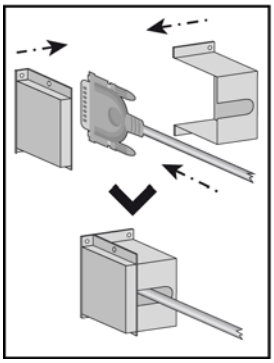

fig. 3.4.2.e

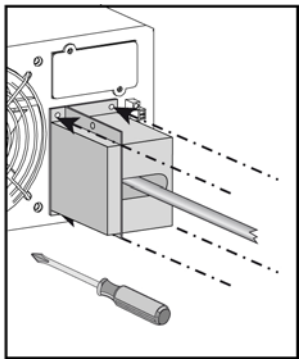

fig. 3.4.2.f

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4 OPERATION

4.1 OPERATING PANEL

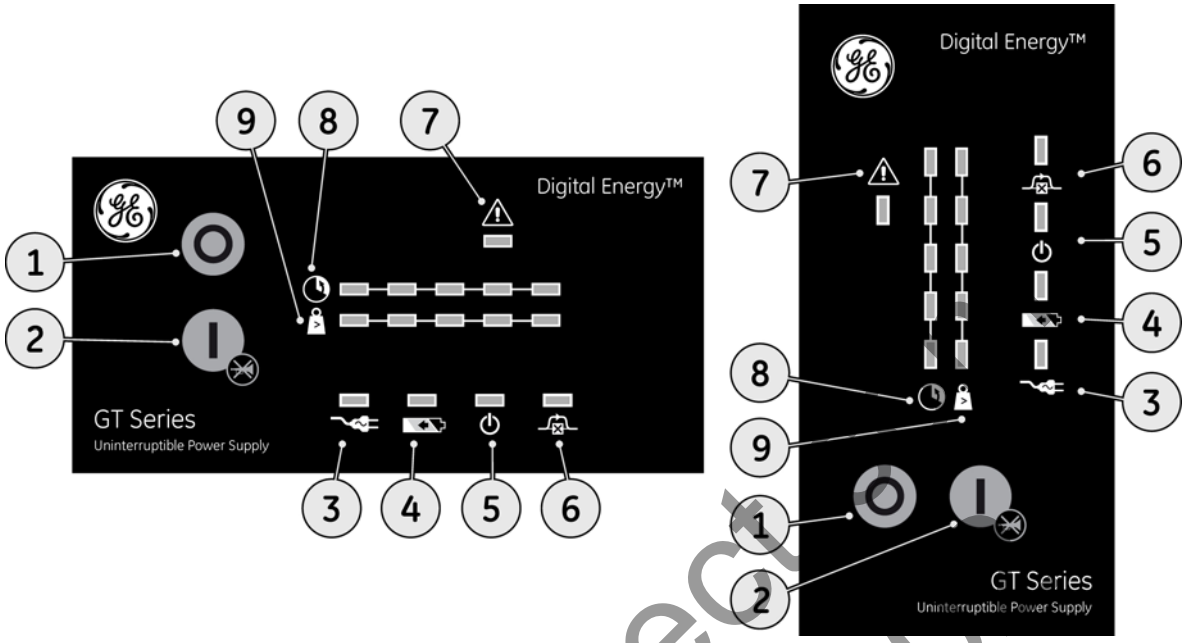

fig. 4.1: operating panel

switch / LED		main function
1	'UPS off' switch	switches the UPS from normal operation to bypass and from bypass or battery to standby.
2	'UPS on' switch	switches on the UPS, starts quick battery test (see section 4.5), mutes the buzzer.
3	LED 'mains available' (green)	indicates availability of power mains.
4	LED 'battery' (yellow)	on in case of battery operation: the mains power fails, and the internal batteries supply the required power until either they are depleted or mains power returns.
5	LED 'operation' (green)	on when the output is supplied by the UPS (inverter).
6	LED 'bypass' (yellow)	on when the UPS operates in bypass mode: the incoming mains power is channeled directly to the load. Blinks if the input voltage is out of bypass tolerance (see section 4.4.4 for more details).
7	LED 'alarm' (red)	on in case of alarm.
8	LED bar 'runtime capacity'	the remaining available battery runtime for the actual load, in % of the maximum runtime with the actual load. When the alarm LED is on, this bar may show a combination of LEDs, describing the Alarm cause (see 4.4).

1º LED:	0-20%	green
2º LED:	21-40%	green
3º LED:	41-60%	green
4º LED:	61-80%	green
5º LED:	81-100%	green

9	LED bar 'load'	indicates to what extent the output capacity of the UPS is used by the actual load. If e.g. the 25% and 50% LED are on, the load exceeds 26% of the maximum load. If all 5 LEDs are on the unit operates in overload. As this is an abnormal situation the alarm LED will be on as well.

1º LED:	0-20%	green
2º LED:	26-50%	green
3º LED:	51-75%	green
4º LED:	76-100%	green
5º LED:	>100%	yellow

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4.2 START-UP

4.2.1 Start-up of a single unit

1. Ensure all switches and breakers upstream to the UPS are closed.
2. Switch input circuit breaker to position "On" (fig. 4.2.1).
3. Wait 45 seconds to allow the output voltage to stabilise.
4. Press keypad "I" for 1 second. Within few seconds LED 'operation' will be illuminated and LED 'bypass' will be extinguished.
5. The unit is now in operation; equipment connected to the UPS can now be switched on.
   Load % will be shown on LED bar 'load'.

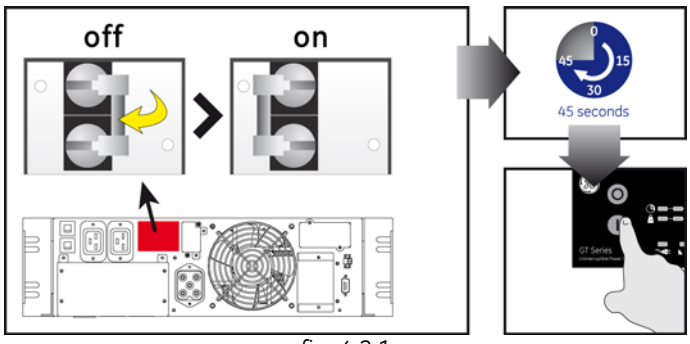

fig. 4.2.1

4.2.2 Start up of a parallel system

1. Ensure all switches and breakers upstream to all UPS in the system are closed.
2. Switch to position "On" the input circuit breaker on all UPS in sequence (fig. 4.2.1).
3. Wait 45 seconds to allow the output voltage to stabilise.
4. Press keypad "I" on each UPS for 1 second. Within few seconds LED 'operation' will be illuminated and LED 'bypass' will be extinguished.
5. The parallel system is now in operation; equipment connected to the system can now be switched on. The load will be shared between the UPS as shown on the LED bar 'load'.

4.3 USE: NORMAL OPERATION

4.3.1 Normal operation conditions:

1. The mains supply is present or within the tolerance (see chapter 9).
2. The UPS is on.
3. The load does not exceed the capacity of the UPS and
4. The operating temperature is below alarm level.

4.3.2 Switching off

1. Be sure that the load has been shut down in a controlled way.
2. Press keypad "O" (fig. 4.3.2.a) for 1 second to switch the unit to bypass.
3. Press one more time the keypad "O" for 1 second to switch off the unit (fig. 4.3.2.a).

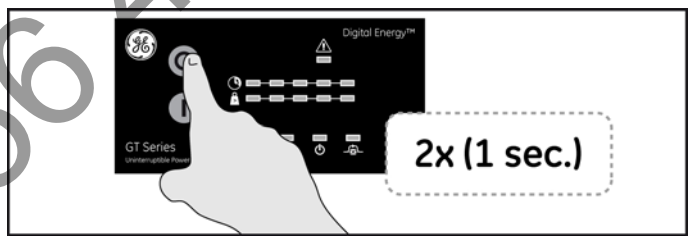

fig. 4.3.2.a

If electrical isolation is required (e.g. for maintenance purposes) proceed with steps 4-7 below:

4. If applicable, open any output circuit breaker/switch.
5. Turn the UPS input switch to position "Off" (fig. 4.3.2.b).
6. Disconnect the battery cabinet cable at the rear of the UPS to eliminate any DC power supply.
7. Ensure all switches and breakers upstream to the UPS are open.

All LEDs should be out on the front panel; the UPS is shut down.

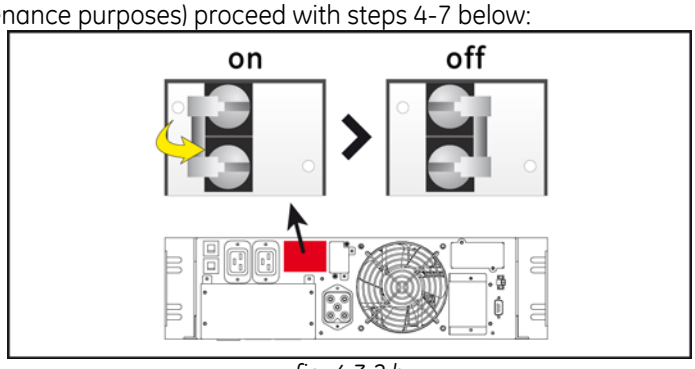

fig. 4.3.2.b

	NOTE The residual DC voltage in the unit will be eliminated within 5 minutes.

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4.4 USE: STATUS AND ALARM INDICATIONS

o status indications the operating mode

! low priority alarms abnormal operating situations

!! high priority alarms situations in which *the actual output voltage of the UPS is no longer guaranteed*; immediate action should be taken

	Situation	Indicators on front panel (fig 4.1)							
o	**Stand-by** (4.4.9)			———			1 - 5 ———		
o	**Normal operation** (4.3.1)	———		———			1 - 5 ———	0 - 4 ———	
!	**Overload warning** (4.4.5)	———		———			1 - 5 ———	5 ———	- - - - 1 / 0.5 sec
!!	**Battery not connected** (4.5)	———		———	- - - -	———		0 - 4 ———	———
!!	**Replace battery** (4.4.5)	———		———		———	1& 3 ———	0 - 4 ———	- - - - 1 / 60 sec
!	**Bypass out of limits** (4.4.4)	———	- - - -	———			1 - 5 ———	0 - 4 ———	
o	**On bypass** (4.4.1)		———	———			1 - 5 ———	0 - 4 ———	- - - - 1/120 sec
o	**On battery** (4.4.2)				———		1 - 5 ———	0 - 4 ———	
!!	**Battery low** (4.4.3)	———			———		1 - - - -	0 - 4 ———	- - - - 1 / 5 sec
!!	**Fault on bypass**		———	———		———	- - - -	0 - 5 ———	- - - -
!!	**Fault stand-by**					———	- - - -		———

Operating modes and corresponding indications, see 4.3.1 - 4.3.2 and 4.4.1 – 4.4.9.

- - - - : intermittent
——— : continuous
0 – 5 : number of LEDs that can be on, depending on runtime capacity / load bar
mute buzzer : press push button 'I' briefly

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4.4.1 On bypass

The UPS is equipped with an automatic bypass switch. This switch automatically transfers the load to the mains if the UPS is unable to deliver the demanded output power due to overload or overtemperature. If all 5 load LEDs are illuminated, bypass operation is caused by an overload. If only first load LED is illuminated, bypass operation is caused by overtemperature (see 4.4.8 tab .1).
The UPS will switch back to normal operation when the overload has been removed or the temperature has dropped below alarm level.
If a power failure occurs during bypass operation, the UPS will switch to battery if possible, otherwise ***output power is lost.***

4.4.2 On battery

In normal operation conditions, if a mains failure occurs, the UPS uses the energy stored in the batteries to supply the load.
The runtime capacity LED bar will show the remaining time (see 4.1).
For further information about runtime refer to chapter 9, Battery runtime.
The UPS will shutdown:

- After the batteries have been discharged (automatic restart if enabled), or
- If keypad 'UPS off' is pressed (restart via front panel required), or
- If a 'UPS shutdown' command is given by the computer (via UPS monitoring software). Restart depends on the setting of "auto-restart" function (see 4.4.13).

4.4.3 Battery low (end of runtime)

If during battery operation the buzzer starts beeping every 5 seconds and the first LED of the battery charge bar starts blinking the batteries are nearly discharged: the remaining runtime is less than 2 minutes (default setting, adjustable via the UPS monitoring software). Controlled shutdown of any computer equipment is absolutely necessary when this alarm is raised.
If the UPS operates at 100% load, the shutdown procedure should be completed within 2 minutes after the 'battery low' alarm started. If only part of the output capacity of the UPS is used this period can be longer, with aged batteries this period can be shorter.
When the batteries are fully discharged, the UPS is no longer able to supply the connected equipment and eventually ***output power is lost.***

4.4.4 Bypass out of limits

The mains voltage or mains frequency are outside bypass tolerance but inside UPS input tolerance (see chapter 9). Bypass operation is inhibited: if for whatever reason the UPS is not able to deliver the required output, ***output power is lost.*** If the input frequency is often out of tolerance – during which bypass operation is inhibited and an alarm is generated – it may be useful to disable bypass function (via UPS monitoring software) after which the unit operates as a UPS without automatic bypass switch.

NOTE

The unit can be used as frequency converter: the input frequency range is 47.5-63Hz, the output frequency is selectable 50/60 Hz, via UPS monitoring software.
If the unit is used in this configuration, the bypass function is no longer available.

4.4.5 Overload

The demanded power exceeds the nominal capacity of the UPS. The "overload warning" alarm occurs when the load exceeds 150% the UPS will immediately switch to bypass, assuming that the conditions for a transfer to bypass are fulfilled.
If an overload condition between 110-150% persists, the UPS will also switch to bypass operation. In both conditions the "overload" alarm (see 4.4.8 tab. 1) is generated.
During an overload the UPS may automatically switch off within a few minutes (load dependent) and output power is lost:

- if a transfer to bypass is inhibited (see section 4.4.4), or
- if the bypass function has been disabled (see section 4.4.4), or
- if the UPS operates on battery (see section 4.4.2).

To avoid these problems, be absolutely certain that the power demand of the protected equipment is within the limits of the UPS.

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4.4.6 Replace battery

Either the batteries are almost chemically worn out or the battery wiring, including the battery fuse, is faulty. If the batteries are aged, they must be replaced as soon as possible to ensure full protection for your equipment (see section 7.4.1). Perhaps the 'replace battery' alarm occurs after a test which you started immediately after installation or after a power failure. In this case the alarm may be incorrect as the batteries have been (partly) discharged during transport or storage or during the power failure. For this reason we advise to ***execute battery test only ater 5 hours on line operation with no mains failures.*** This allows the UPS to recharge the batteries.

4.4.7 Alarm priority

'General alarm' comprises a group of alarms; the buzzer behaviour indicates the priority of the generated alarm.

ON: Battery not connected (see section 4.5)

1 / 0.5 secs.: Overload (see section 4.4.5)

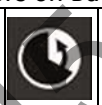
1 / 4 secs.: General Alarm

1 / 60 secs.: Battery test failed (see section 4.5)

1 / 120 secs.: On bypass (see section 4.4.1)

4.4.8 Fault mode

The UPS may be in "fault mode" if the following failure occurred:

	Fault Situation	Indicators on Battery Charge Bar						
			LED 1	LED 2	 LED 3	LED 4	LED 5	Buzzer
!!	**Charger Overvoltage**	———				———	———	- - - - 1 / 4 sec
!!	**Output Short Circuit**	———					———	- - - - 1 / 4 sec
!!	**Negative Power**	———		———			———	
!!	**Overload**	———	———	———	———	———	———	- - - - 1 / 0.5 sec
!!	**Overtemperature**	———	———					- - - - 1 / 4 sec

——— = continuous - - - - = intermittent !! = high priority

In "fault mode", the UPS is "forced" on bypass or stand-by. After having solved the cause of the fault condition you have to press the 'UPS off' button for 0.5 seconds to switch the UPS to normal mode or restart the unit.

4.4.9 Stand-by

In stand-by mode the UPS is turned off (***output power is lost***) and the batteries are being recharged.
To put the unit in this condition press for 1 second the 'UPS off' switch, the unit switches to bypass.
Press one more time 'UPS off' switch for 1 second. The unit is now in stand-by mode.
Most changes of UPS settings are only possible in bypass or stand-by mode.

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4.4.10 Emergency Shutdown (ESD)

For safety reasons, an external 'emergency off' device (switch or relay) can be connected to the ESD terminals 1-2 (fig. 4.4.10).

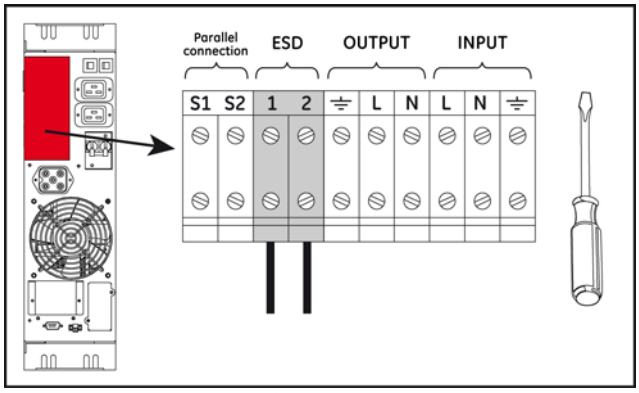

fig. 4.4.10

4.4.11 Remote Power Off (RPO)

RPO may be created by replacing the link with a switch with the characteristics of a 'power off' button (see fig. 4.4.11). Under normal conditions the switch has to be closed, when it opens the UPS will transfer to stand-by mode and ***output power is lost***.
It is not possible to restart the unit while the RPO switch is open.
After closing the RPO switch press 'UPS off' button 2 times within 4 seconds to be able to restart the unit.

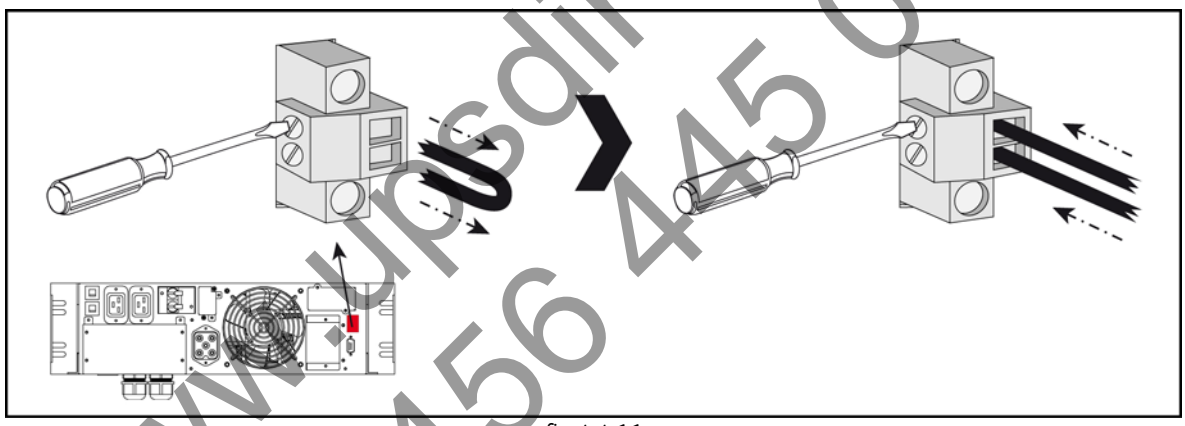

fig.4.4.11

4.4.12 No load shutdown

If this function is enabled and the load is <5%, the UPS will in case of a mains failure switch off and ***output power is lost***.
"No load shutdown" is disabled as default.

4.4.13 Auto Restart

The function may be enabled or disabled via UPS monitoring software. Auto Restart function acts after the UPS has been shut down during a mains failure due to discharged batteries, no-load shutdown or shutdown commanded by remote control:
- if the function is set "enabled", the UPS will automatically restart when the mains returns
- if the function is set "disabled", a manual restart is required, either as explained in section 4.2.1 or via the UPS monitoring software.

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4.5 BATTERY MANAGEMENT

Maximum battery life and reliability are obtained by the following features:

- **Battery connection test**
  At start-up and every minute the unit performs an automatic test to check that the battery cabling and fuses are properly connected.
  If the test detects a battery disconnection, the corresponding alarm will be generated (see section 4.4.7).

- **Quick battery test**
  A quick battery test may be launched to check whether batteries are healthy. To start the test, press 'UPS on' button (see section 4.1) for 0.5 seconds when the unit is in "normal operation" conditions (see section 4.3.1).
  In case of failure the corresponding alarm will be generated (see section 4.4.6 / 4.4.7)

- **Deep battery test**
  A deep battery test will update the runtime calculation and may be started via the UPS monitoring software. The test will start only if the battery charge level is higher than 90% and the load must be at least 20% of the nominal rating. The runtime calculation will be updated only if the test can run uninterrupted till complete battery discharge.

	NOTE When executing a deep battery test the available runtime in case of mains failure may be shorter than normal. Don't execute this test if reduced battery runtime is not acceptable.

	NOTE It's possible to reset the battery test, by pressing the 'UPS off' switch (see 4.1) for 0.5 sec. The UPS will switch to bypass mode.

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5 COMMUNICATION

5.1 DB9 COMMUNICATION PORT

The RS232 port is a plug-in interface port, which enables advanced communication between the UPS and the computer via serial cable (fig. 5.1) and UPS monitoring software.
The interface port is already operative in stand-by mode (see section 4.4.9).

To change settings of the unit, we strongly recommend to be sure that the unit is in stand-by mode. Some settings can only be changed if the UPS operates in bypass or stand-by mode.

	NOTE The change of some settings can cause the unit to switch from bypass to standby and output power is lost.

For more information regarding possible settings, please refer to the "Help" manual of the UPS monitoring software.

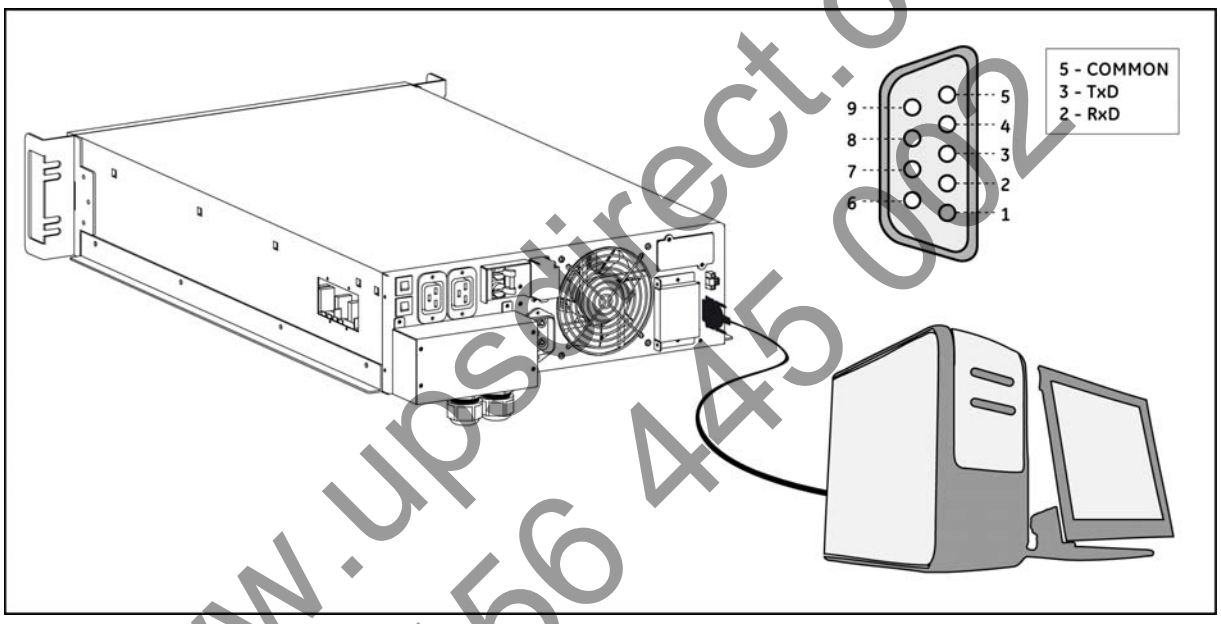

fig. 5.1

5.2 SNMP INTERFACE CARD (OPTION)

This card allows the data interface to be connected directly to an Ethernet network. The card is fitted into the SNMP Card slot (8, fig. 3.3.5.a). For more information, please refer to the user manual that comes with the interface card.

6 OPTION: EXTENDED RUNTIME

Extended runtime can be obtained by connecting a separate battery extension pack to the UPS. In this case the UPS must be informed about the new total battery capacity to allow a reliable recalculation of the available runtime (via UPS monitoring software). Depending of the charge condition of the new batteries the new runtime calculations may temporarily be unreliable.

Additional batteries increase the recharging time for the unit; all other operational information is the same as for standard models.

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7 MAINTENANCE

7.1 SAFETY

DANGER

When the UPS operates, all parts of the electronics are directly connected to the utility and high voltages are present on all internal parts, including the battery. Even after disconnection from the utility, all parts inside the UPS, including the battery, conduct dangerous voltages (except the COM port output). For your safety, only authorized service personnel may remove the cabinet cover.
Refer to section 4.3.2 for further details.

7.2 GENERAL

The GE Digital Energy GT Series UPS is virtually maintenance free: take care of proper environmental conditions and keep air inlets/outlets free of dust. Please read 3.2.

NOTE

Apart from battery replacement refer maintenance and service work to qualified and skilled personnel only.
Refer to section 1.2 for further details.

7.3 RECYCLING THE UPS AT THE END OF SERVICE LIFE

NOTE

This product has been designed to respect the environment, using materials and components respecting eco-design rules. It does not contain CFCs (Carbon Fluorine Chloride) of HCFCs (Halogen Carbon Fluorine Chloride).

The batteries contain lead, which is a harmful substance for the environment.
Proper disposal or recycling of the batteries is required. Refer to your local codes for disposal requirements.

GE Consumer & Industrial, in compliance with environment protection recommends that the UPS equipment, at the end of its service life, must be recycled conforming to the local applicable regulations.

7.4 BATTERIES

The service life of the battery is from 3 to 6 years, depending on the operating temperature and on the number of discharge cycles.

As a healthy battery is critical to the performance of the UPS, an automatic quick battery test is performed regularly to ensure failsafe operation (see section 4.5). When the condition of the battery is critical, a 'replace battery' alarm will be activated (see 4.4 and 4.4.6). Replace the batteries as soon as possible.

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7.4.1 Battery replacement

Please refer to figure 7.4.1. Battery cabinet is the same for both power ratings, 6000VA and 10000VA.

NOTE
During battery replacement the UPS will not be able to support the load if a mains failure occurs! It is recommended to switch off the load before disconnecting the DC connector as in section 4.3.2.

1. Remove the battery cable between battery cabinet(s) and UPS.
2. Remove battery cables between eventual further battery cabinets.
3. Replace the battery pack.

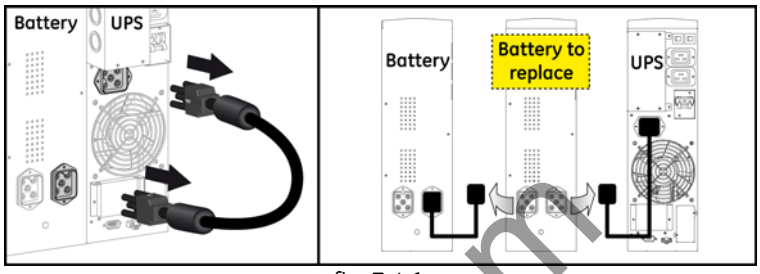


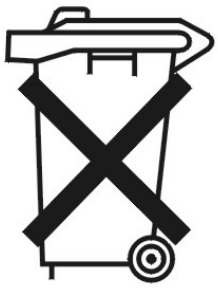
fig. 7.4.1

NOTE
To avoid battery malfunction, all battery packs have to be replaced! It's not possible to replace only 1 pack. Avoid connections between new and old battery packs.

4. Connect battery cables between additional battery cabinets.
5. Connect battery cable between battery cabinet(s) and UPS.
6. Check that battery data is set correctly via UPS monitoring software.
7. The UPS is now ready to supply the load in case of mains failure.

General guidelines:

- When replacing the batteries, use all of them of only the same type and size.
- Never short the battery terminals. Shorting may cause the battery to burn. When working with batteries remove watches, rings or other metal objects and only use insulated tools.
- Avoid charging in a sealed container.
- Proper disposal of batteries is required: refer to your local codes for disposal requirements.
- Never dispose batteries in fire: they may explode.
- Never disassemble or reassemble batteries; their contents (electrolyte) may be extremely toxic. If exposed to electrolyte, wash immediately with plenty of water, if eye contact occurs flush with water and contact a physician.


Don't throw batteries away, treat them as harmful waste

The following table shows runtimes with up to 3 Battery Packs. 1 Battery Pack is the normal configuration.

Unit	Load	Number of battery packs		
		x1 (normal)	x2	x3
GT 6kVA CE	10%	201 min	346 min	555 min
	25%	60 min	150 min	238 min
	50%	26 min	61 min	99 min
	75%	16 min	38 min	63 min
	100%	10 min	26 min	44 min
GT 10kVA CE	10%	110 min	255 min	349 min
	25%	37 min	87 min	155 min
	50%	15 min	37 min	62 min
	75%	8 min	22 min	37 min
	100%	5 min	15 min	26 min

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8 TROUBLESHOOTING

Whenever a malfunction occurs, first check external factors (e.g. connections, temperature, humidity or load) to determine whether the problem is caused by the unit itself or by its environment. Subsequently check the thermal circuit breaker: it may be tripped. If so: reset it (see fig. 3.3.5.a/b) and be sure that the UPS is not overloaded.

The following chart is a simple troubleshooting checklist. If the suggested solution does not succeed, or if the information is insufficient to solve the problem, please contact your dealer or consult www.GEDigitalEnergy.com

PROBLEM	POSSIBLE CAUSE	SOLUTION
No display No alarm (UPS switched off)	Mains switched off	Switch on mains supply
	No mains voltage present	Carry out mains inspection, consult qualified electician
	Input fuse blown or circuit breaker tripped	Replace fuse or reset breaker
Mains indicator not illuminating, acoustic alarm intermittent	No mains voltage present	Read section 4.4.2 – UPS on battery
Mains indicator not illuminating, mains voltage present, acoustic alarm intermittent	Input fuse blown or circuit breaker tripped	Replace fuse or reset breaker
Alarm LED illuminated, continuous acoustic alarm	UPS failure	Contact UPS dealer or go to www.gedigitalenergy.com
	UPS overtemperature	Allow UPS to cool down
	Overload at UPS output	Reduce UPS load
Delivered runtime less than specified	Battery extension fuse switch is in 'Open' position	Switch to 'On' position
	Batteries are not fully charged	Charge batteries for 8 hours and reconfirm runtime
	Batteries are defective	Contact UPS dealer
	Charger is defective	Contact UPS dealer
Last load bar LED is lit, acoustic alarm intermittent	Overload at UPS output	Reduce UPS load
No communication between UPS and load	Incorrect communication cable	Check whether correct cable is used
	PC interface defective or being accessed by another service	Check if no other software is accessing the interface
	Interference on the data cable	Rearrange cables

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9 SPECIFICATIONS

Model	:	**GT6000**	**GT10000**
Ratings			
Voltage Amperes (VA) with computer type load	:	6000	10000
Watts (W) with resistive load	:	4200	7000
Input thermal circuit breaker (A)	:	30	63
Internal input fuse 250V, slow (A)	:	30	30*2
Input converter			
AC input voltage	:	Nominal: 230 V	
AC input voltage range	:	84 - 276 V (84-175V with load de-rating) input >276 Vac: UPS switches to battery operation	
Input current waveform	:	sine wave	
Input current (A) at nominal input voltage	:	20.6	34.6
Input power factor	:	> 0.97	
Input frequency range	:	40 - 70 Hz	
Inrush current	:	60A	
Output converter			
AC output voltage	:	220 / 230 / 240 V (selectable)	
AC output voltage tolerance	:	± 2%	
Output frequency	:	50/60 Hz, auto selection	
Output frequency range	:	nominal ± 5% with mains synchronizing	
Output waveform	:	sine wave	
Harmonic distortion	:	< 3% with linear load, < 8% with non-linear full load	
Power factor	:	0.7	
Crest factor (peak to RMS current)	:	≤3:1	
Capacity appliance outlets	:	with 55A Terminal Block	
Bypass			
AC input voltage range	:	± 10% of selected output voltage	
Frequency tracking rate	:	1Hz/s	
Frequency tracking range	:	± 5% of selected frequency	
Typical transfer time, msec	:	0.5	
Overload capability	:	fully protected against overload and short circuits	
Overload behaviour during battery operation	:	125% during 1 minute 150% during 10 seconds	
Overload behaviour during bypass operation	:	depends on rating of thermal circuit breaker typical: 125% of TCB value for 200 seconds 200% of TCB value for 10 seconds 300% of TCB value for 4 seconds	
Batteries (ratings given for 25°C)			
Nominal voltage (Vdc)	:	240	240
Number / Ah batteries (in battery kit and battery ext. pack)	:	20pcs / 8Ah	20pcs / 8Ah
Type	:	sealed lead acid, maintenance free	
Service life	:	up to 5 years (depending on use)	
Recharge current	:	1.2 A	
Battery recharge time (batt. discharged at 100% load)	:	5 hours for 90% capacity	
Runtime in minutes at typical load (75%)	:	17	9
% VA/Watts			
25% 1500/1050	:	66	
50% 3000/2100	:	28	
75% 4500/3150	:	17	
100% 6000/4200	:	12	
% VA/Watts	:		
25% 2500/1750	:		37
50% 5000/3500	:		15
75% 7500/5250	:		9
100% 10000/7000	:	-	5
General			
Weight UPS kg	:	24.5	
Dimensions UPS (hxwxd)	:	130x410x660mm	
Weight battery pack kg	:	67	
Dimensions battery pack	:	130x410x660mm	
Enclosure / protection	:	steel-plastic / IP20	
Environment			
Safety	:	EN 62040-1	
Electromagnetic compatibility	:	EN 62040-2 (2006)	
Ambient temperature	:	0 to +40°C	
Audible noise at 1 meter	:	< 55 dB(A), load and temperature dependent	
Max. relative humidity	:	90% (non-condensing)	
Colour	:	Black - RAL 9005	

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